# The Citrus Industry

**Don't We Agree . . . .**

"Drink Florida orange juice for health!" So said Mrs. D. Leigh Colvin, national president of the Women's Christian Temperance Union, when she visited Lakeland recently. Pretty Nelda Forehand (left) obliged by providing Mrs. Colvin with all the orange juice she could drink.

Vol. 28, No. 3 March, 1947

# *You can see* V-C *in the crop*

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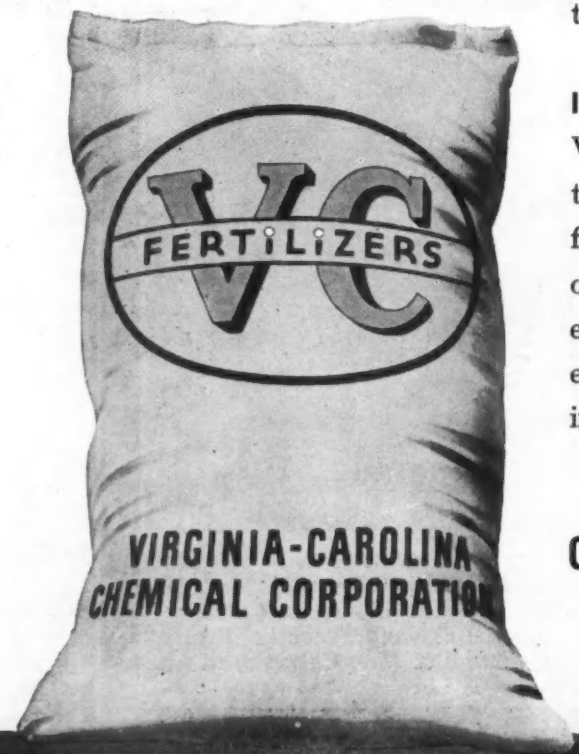


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**V-C FERTILIZERS *MAKE THE GOOD EARTH BETTER***

# Process of Control Measures Against White-Fringed Beetle . . .

ARTHUR C. BROWN
Plant Commissioner, State Plant Board

The topic assigned to me by Mr. Beale, "Progress of Control Measures Against White-fringed Beetle", may be approached from two different angles: first, progress made been a considerable spread of the weevil from the comparatively small area in which it was found in 1936; and second, progress made in the development of control measures seeking to reduce crop injury.

A study of maps depicting the area in the South now known to be infested with white-fringed beetle might lead the uninformed observer to believe that there has bee na considerable spread of the pest from the original quarantined area. We do not believe this to be the case. On the contrary, we believe that, through quarantine enforcement, dissemination of the insect into non infested areas in Florida and other states has been retarded. How, then, can we account for the fact that the pest is firmly established over large areas in Alabama, Mississippi, Louisiana, Georgia, and North Carolina, and that this information was not developed until after the initial finding in 1936? In our opinion, white-fringed beetle was present in those areas at the time, or even before it was officially announced in 1936 that a pest new to the United States had been found in west Florida. Let us examine the records to see if we can find anything to substantiate this theory.

The first official record of the presence of white-fringed beetle was made in the late summer of 1936 when it was found in the northeast corner of Okaloosa County and the northwest corner of Walton County, both in Florida. As is frequently the case with newly introduced insects believed to be capable of causing serious economic losses, eradication was deemed desirable. In any eradication project, full information as to the extent of the area infested is essential to the success of the endeavor. Immediately following discovery of white-fringed beetle, inspections were made in ever widening circles away from the side of the initial infestations. It was soon learned that the insect was widely and firmly established in Escambia County, Florida, and in Louisiana, Mississippi, and Alabama. Furthermore, it was learned that instead of one species, as was first thought to be the case, there were six closely related species in the country. A few years later, white-fringed beetle was found in a number of counties in North Carolina.

(Continued on page 24)

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The Citrus Industry
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Representing no special interest

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# Research Needs In The Citrus Industry...

J. L. HEID
Florida Citrus Canners Cooperative
Lake Wales, Florida, at Convention of National Canners' Association, Atlantic City, Jan. 22.

It is perhaps as well that your speaker had only a few days in which to prepare this discussion of the research needs of the Citrus Industry. While the shortness of time made it impossible to attempt a complete analysis, or append a list of references; it also discouraged the tendency to overestimate what research can accomplish.

A story is told of three gentlemen who entered a cocktail lounge. One barely made it through the door to collapse on the floor. A second managed to hang his chin on the foot rail. The third gazed foggily at the dispenser of joy and forgetfulness.

"What's yours, Chum?" inquired that dignitary.

"A double scotch and soda," confidently replied the nearly vertical musketeer.

"And your friend?" indicating the man sagging on the rail.

After a careful scrutiny the leader of the party estimated: "A single scotch and soda for him."

"And the other chap?" nodding toward the prostrate bon vivant.

The spokesman turned, looked at the floor sniffer and shook his head from side to side. "Nothing for him. Nothing at all. He's driving."

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It is not my intention to disparage the value of research, nor to deny the need for research in the citrus industry. The point is rather that research should not be expected to furnish an easy solution for all difficulties.

This discussion will not attempt to indicate all research needs of the citrus industry. Instead an effort will be made to describe three groups of problems which appear to be urgent to canners and which may be similar to problems which exist in other fruit and vegetable industries. While overlapping of these problems prevents concise classification, the discussion will be divided into three parts:

1 Market Research.

2 Improvement and Standardization of Manufacturing Methods and Finished Products.

3 The Development of New Products.

### Market Research

While it isn't conventional to discuss market "research" before a group of technologists, in this instance, something is meant beyond surveys and analyses which technologists consider important preliminaries to, essential bases for, and integral parts of,—but not in themselves,—research.

It appears fairly certain that one of the most urgent research needs of the citrus industry at the present moment is to determine by experiments and tests how the eating habits of the American public can be influenced so that the entire population will purchase and consume **at least half** of **minimum** nutritional requirements of citrus fruits and products, at prices which will return not less than the cost of production to growers of the fruit. As the entire crop of oranges and grapefruit is equivalent to **less than a third** of **minimum** needs such a development would ncessitate the importation of supplemental quantities of citrus fruits and products and would stabilize the marketing of citrus fruits and products as staple foods.

In considering our nutritional requirements of citrus as a basic food, it must be confessed that our knowledge of nutrition hasn't progressed very far since Ambrose Bierce defined a wholesome food as "A worm to a frog, a frog to a snake, a snake to a pig, a pig to a man, or a man to a worm."

On the other hand, when flavored and colored mixtures of sugar and citric acid, with a pinch of synthetic ascorbic acid are advertised to hospitals as health "foods"

equivalent to fruit juice, and when packers of flavored and sweetened powdered milk (an excellent basic food requiring no crutches) add a few synthetic vitamins and imply that a glass of the beverage is equivalent to a four-color page-full of fruits, vegetables and other natural foods, it would appear that the packers of citrus products selling for less than the cost of production need to consider using all favorable evidence from reputable sources in promoting the nutritional importance of these foods.

Surveys by the National Research Council, the U. S. Department of Agriculture and other investigators unanimously agree that in this, the best fed nation in the world, half the people suffer from malnutrition, —not the gross deficiencies which are apparent to casual observation, but the hidden hungers which result in subnormal development of bones, teeth and body tissues and in impaired resistance to infectious diseases.

These surveys further reveal that it is not lack of availability of basic foods which is primarily responsible for conditions which exist. On the contrary, the prevailing pattern of inferior food habits is: the **substitution** of excessive quantities of refined foods—such as sugar, starch, distilled liquors, refined oils, polished rice, highly milled flour—for the basic natural foods which would supply minerals and vitamins necessary for normal development and health. There is no harm in refined foods, but the fact that they comprise a large portion of our diet emphasizes the importance of including in **daily** diets compensating quantities of **natural** foods richest in essential minerals and vitamins. These foods have been divided into six groups which are:

1. Cereal products, particularly those containing portions of the grain rich in minerals and vitamins.
2. Dairy products, including milk, butter and cheese.
3. Meat, fish and poultry products, including eggs.
4. Fruits and vegetables, generally.
5. Fruits and vegetables, rich in carotene, and
6. Citrus fruits.

This discussion will be confined to citrus fruits and products, but it appears reasonable that the problems affecting the packing and distribution of these foods resemble those affecting the packing of other basic foods. Although a nutritional deficiency of great prevalence in all income groups is in food elements abundant in citrus fruits; although our total crop of oranges and grapefruit is equivalent to only a third of our minimum requirements for balanced nutrition; although the citrus industries in American producing areas are doing an excellent job of sales and publicity promotion and consumer advertising; although it is possible to produce and deliver to consumers oranges and grapefruit and canned juices at prices that make these foods outstanding bargains in today's food market,—recent prices have been at levels which failed to return costs of production and distribution.

Consumers may purchase abundant supplies of canned citrus juices at less than a cent an ounce, less than the price of soda pop! Carbonated beverages are pleasant and convenient thirst quenchers with no food value except their sugar content. Canned citrus juices are also pleasant and convenient thirst quenchers with an approximately equal sugar content. In addition, research reports indicate that citrus juices are richest available food sources of **ascorbic acid, citrin** and **inositol,** and are good sources of naturally balanced B factors and minerals to compensate for the large proportion of refined foods in American diets.

When consumers fail to deplete markets of canned citrus juices at prices lower than soda pop, and growers receive less than productions costs for fruit, research must be needed on the problem of altering American food habits so that sufficient citrus is eaten to protect the health of consumers **and** insure that this crop is sold at prices which will encourage continued production.

Research sponsored by the National Canners Association, the Florida Citrus Commission, the Nutrition Foundation, the California Fruit Growers Exchange and others has revealed the success of improved canning methods in retaining water-soluble B and C vitamins in citrus juices.

Citrus fruit has received its greatest publicity as a rich and stable source of vitamin C. Dr. C. G. King, Director of the Nutrition Foundation, discussing home methods of food preparation, stated: "With the exception of citrus juice, 80 to 90 per cent of the vitamin C content of the diet is regularly lost between the market and the dinner plate."

Scoular and Bryan, reporting tests of school lunches planned by dietitians and served at the North Texas Teachers College Demonstration School found that the only day during the test period that lunches were not grossly deficient in **ascorbic acid** was when an orange, served as desert, supplied 97 per cent of the vitamin C content of that lunch.

The spectacular value of citrus fruit as a source of vitamin C has been demonstrated in human and animal tests on calcium metabolism and dental health. However, less well known nutritional factors in citrus fruit are of equal importance. **Citrin,** has no less value as a **capillary fragility factor,** although it has defied efforts to isolate and purify it without destroying potency. Evidence is accumulating, not only of its favorable influence upon the utilization of vitamin C, but also of its value in preventing blindness from **hemorrhagic retinitis** and for treating certain forms of **hypertension** and **psoriasis.** Limited evidence indicates that it may have value in preventing **erythroblastosis** in pregnancies involving Rh negative mothers and Rh positive infants. Citrus fruits are rich sources of **citrin.** Raw or canned juice may supply normal needs, while sufficient concentrates for clinical requirements can be recovered from peel residues from processing.

Another vitamin abundant in citrus fruits is **inositol,** which got a bad start because it failed to cure or prevent baldness, a virtue surmised or hoped for by early investigators. It is now becoming recognized as a **lipotropic factor** which may have a balancing influence in minimizing damage to the liver as a result of unbalanced diets or self medication with synthetic vitamins. As both **citrin** and **inositol** are abundant in citrus peel, these substances may contribute to the reputation dried citrus peel has as a "conditioner" or "tonic" in cattle feeding!

Citrus fruits are not only rich sources of **ascorbic acid, citrin** and **inositol.** They also contribute naturally balanced B complex factors and minerals to the diet. The facts uncovered to date are all in favor of the benefits to be derived by the public from trippling consumption of citrus fruits and juices. The problem of promoting a general realization of these facts is some-

thing like the weather:—people talk about it, but so far, relatively little has been done to extend and supplement standard advertising and sales promotion methods. It is reasonable to believe that packers of citrus juices may promote public recognition of the importance of these foods by working with professional people in a position to influence eating habits. This will include those who practise and teach medicine, dentistry, dietetics, home economics and allied sciences. The California Fruit Growers Exchange has prepared a colored motion picture which strikingly illustrates the value of citrus juices in increasing the rate and strength of wound healing following abdominal surgery. This has been acclaimed by physicians, dietitians and nurses, and its success illustrates the possibilities in this field.

An urgent research need of the citrus industry today is to determine the quickest and most effective means for bringing to the entire American Public a realization that citrus fruits are not luxuries but staple foods.

Six ounces of juice or an equivalent quantity of fruit is necessary in the diet every day to avoid deficiencies. A pint or more per day is desirable for nursing and expectant mothers, for invalids and elderly people and for every one to furnish, together with other basic foods, optimum protection against such infections as colds.

The problem of modifying the eating habits of sixty million Americans isn't an easy one. The cultivation of educational agencies is obviously desirable. Children accustomed to regular adequate quantities of citrus juices and other basic foods in school lunches will take healthier bodies and superior eating habits into their homes and adult lives. As public health and stabilized agriculture are both important to national welfare, government support for educational work is warranted and should have a more permanent value than subsidies.

Intensive cultivation of professional groups in a position to influence eating habits appears indispensible. The fact that all the answers aren't readily apparent is evidence of the importance of market "research" to determine most effective channels which promotion should follow. Technologists should share in developing effective plans to this end.

**Improvement and Standardization of Processes and Products**

Probably the second most urgent research need of the citrus products industry is for improvements in processes and products. The citrus products industry has grown up fast. Citrus juice canning has become a leading industry within a few years. As a result of cut-and-try experimentation by federal, state, commercial, equipment and can manufacturers, and Canners Association technologists, methods have been developed for (1) extracting and screening juice with a minimum incorporation of undesirable constituents, (2) handling juice rapidly, continuously and uniformly, (3) avoiding unfavorable effects of enzyme action or contact with copper alloys, (4) de-aerating and de-oiling by methods which contribute to the standardization and stability of canned juice, (5) heating and cooling juice rapidly and uniformly while it is agitated to avoid local overheating and (6) closing it in cans with a minimum of oxygen or other contaminants.

As a result of these methods freshly canned juice from the best plants has a flavor and food value fully as good as that of raw juice. However, flavor and food value may deteriorate during storage at rates varying with type of fruit and storage temperature. Grapefruit juice is most resistant to the unfavorable influence of high storage temperature. Other citrus juices, in the order of resistance to high temperature storage are: orange-and-grapefruit blend; orange; tangerine; lemon and lime At uniform temperatures (in an incubator) above 95 degrees F. citrus juices tend to deteriorate objectionably within a few months. At average storage temperatures, not exceeding 80 degrees F., citrus juices maintain satisfactory quality for one or two years or longer. At a uniform storage temperature of O degree F., orange juice sealed in cans showed no appreciable loss in flavor or ascorbic acid after five years.

Concentrated orange juice reacts similarly except that it is more subject to the unfavorable influence of high temperatures. When concentrates are stored at excessive temperatures, the rates of darkening, staling and loss of ascorbic acid follow parallel curves.

At present, research needs of citrus juice canners and concentrators include fundamental work upon the ultimate composition: centrators include fundamental work upon ultimate composition: the acids, glucosides, sugars, nitrogen compounds, enzymes, vitamins and other compounds present in varieties of fruit in each of the producing areas as maturity progresses. While much information has been accumulated on the proximate composition of citrus fruits, very little is known regarding ultimate composition. Assays for all known vitamins; accurate measurements of enzyme systems and similar work might supply information which would be valuable for improving maturity standards, processes and products and would probably contribute to our knowledge of the nutritional function of citrus fruits. A practical problem is further improvement in juice extractors to increase sturdiness and ease of cleaning and secure higher yields, and better quality of juice.

Another problem of importance is microbiological control. The first step is in the delivery of fruit to extractors with as nearly sterile surfaces as may be practical. As most juice extractors require sizing of fruit, and fruit sizers are not designed for washing, the only practical method of preventing infection of fruit by organisms accumulating on sizing equipment is to be certain that fruit delivered to sizers is sorted to completely remove spoilage, and that fruit surfaces are substantially free from microorganisms and are completely dry.

Experience in our plant indicates that thorough cleaning of fruit and equipment by effective detergents is more valuable than the use of antiseptics. Procedures have been developed which permit holding microorganisms by colony count methods below 50,000 per ml. in raw juice under most operating conditions. Additional research is needed to improve detergents, and methods for cleaning fruit and equipment as unpasteurized products assume an increasing importance in the marketing of citrus fruit.

Other special problems arise in every phase of citrus products manufacture. Standardization of Citrus Final Syrup or molasses is currently urgent. This syrup is used in animal feeding and in the fermentation industries as a culture medium and as a source of fruit spirits. Wide variations exist in handling of citrus cannery residues, in methods of liming and pressing, in degree of pre-heat

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# U. S. Department of Labor Wage and Hour Contracts

Canners, packers and handlers of fresh fruits and vegetables may find that their status with regard to the taking of certain exemptions from the minimum wage and overtime provisions of the Fair Labor Standards Act may have changed —with resultant financial gains or losses—with the issuance recently of new definitions of the term "area of production" as used in the Act. The new regulations will be enforced by the Wage and Hour Public Contracts Divisions of the U. S. Department of Labor beginning March 1.

As most readers know, Congress, when it passed the Fair Labor Standards Act in 1938, provided for certain exemptions from the law's minimum wage of 40 cents an hour and from its overtime provisions requiring the payment of time and one half the regular rate of pay for all hours over 40 in any workweek. These provisions of the Act apply to workers engaged in interstate commerce or in the production of goods for interstate commerce, including occupations necessary to such production.

Certain of these exemptions with respect to employees engaged in specified operation in the processing and handling of agricultural products will be determined by the new definitions of the term "area of production." The new definitions were made necessary when the Supreme Court in the Holly Hill Fruit Products case, invalidated a former definition because it included a test limiting the number of employees in a plant.

The new definitions, issued on December 25 by the Administrator of the Divisions are expressed in terms of mileage and population and do not include a test limiting the number of employees in an establishment. Thus a cannery which was permitted to take exemptions from the minimum wage and overtime provisions of the Act under the old definition, may not be able to do so under the new. The reverse is true also. Some establishments may now take exemptions which they were denied under the old definitions.

The new definitions are the result of careful efforts to issue regulations along the lines indicated by the Supreme Court in the Holly Hill case. After the old definition was thrown out, the staff of the Divisions gathered economic data related to the specified operations on agricultural and horticultural commodities, held numerous conferences throughout the nation, and conducted six formal hearings in the National offices. The conferences and the hearings were attended by representatives of both industry and labor.

After the conferences and at the conclusion of the hearings, the Divisions formulated the new definitions which distinguished generally between plants operating under "rural-agricultural" conditions as contrasted to those subject to "urban-industrial" conditions and which indicate for each agricultural or horticultural commodity or groups of commodities, the zones which would be deemed to be more or less near where the particular commodity is produced.

Among workers who are exempt from both the minimum wage and overtime provisions of the Act are employees engaged within the area of production in handling, packing, storing, preparing in their raw or natural state, or canning fresh fruits and vegetables for market. Therefore, if your employees are engaged in such work, it is to your interest to know how the Divisions interpret the operations in question.

"Handling" includes those physical operations customarily performed in obtaining fresh fruits and vegetables, transporting them to and receiving them at the establishment, weighing them, placing them in the establishment, and delivering the fruits and vegetables to warehouses or to transporting facilities.

"Packing" includes those operations involved in placing fresh fruits and vegetables in containers, and closing and fastening the containers.

"Storing" includes operations involved in placing fresh fruits and vegetables in storage rooms or other places when they are to be held prior to sale or shipment; taking care of these commodities while they are being so held; and removing them from the storage rooms and transferring them to transportation facilities.

The preparing of fresh fruits and vegetables in their raw or natural state includes such operations as cleaning, washing, polishing, grading, sizing, sorting, hand-picking, coloring, cooling and wrapping.

The term "canning" includes not only hermetically sealing and sterilizing or pasteurizing the fruits and vegetables, but also the necessary preparatory operations performed on them before placing them in bottles, cans or other hermetically sealed containers. These operations may include all types of preparation such as cleaning, cutting, peeling, squeezing, mixing, heating and cooking, and placing the commodities in containers. In addition, sealing and labeling the containers as well as placing them in cases or boxes are considered to be canning operations when performed as a part of the uninterrupted canning process.

It should be pointed out that even though you are a canner, packer or handler within the area of production, not all your employees are exempt, but only those who are actually engaged in performing the specified operations on the fresh fruits and vegetables for market. In other words, the exemption does not ordinarily apply to all the employees in your plant, among whom may be office workers, maintenance men, and guards, just to mention some non-exempt classes of employees. In addition, if in any workweek you have employees who are engaged in both exempt and non-exempt operations, they will not be within the exemption during that workweek.

It should be noted that the "for market" requirement applies to each of the specified operations. Such operations are performed "for market" if the employer disposes of the commodities in the form in

which the exempt operation leaves them, but not if he is going to process the commodities further before marketing them. Thus if you are a canner and have certain of your employees engaged in canning vetgetables for re-canning at a later time, such employees are not exempt as they are not canning for market.

To be within the area of production under the new definition, your establishment must be located in the open country or in a rural community and must have received 95 percent of the fresh fruits and vegetables on which the handling, packing, storing, preparing in their raw or natural state, or canning operations are performed from normal rural sources of supply located not more than 15 miles from your establishment.

As used in this definition, "open country or rural community" does not include any city, town or urban place of 2500 population or greater; or any area within one mile of the limits of any city or town with a population of 2500 to 50,000; any area within three miles of any city with a population of from 50,000 to 500,000; or any area within five miles of any city with a population of 500,000 or more. Population is determined by the latest available United States Census (1940), and miles are measured by a straight line.

Assuming that the 15 mile distance requirement is met your fresh fruits and vegetables will be considered to have come from "normal rural sources of supply" if they are received from (1) farms; or (2) farm assemblers or other customary supplying establishments which are located in the open country or in a rural community; or (3) farm assemblers or other customary supplying establishments which are not located in the open country or in a rural community provided it can be shown that the commodities actually were produced on farms within 15 miles from your establishment.

The period for determining whether 95 percent of the fresh fruits and vegetables are received from normal rural sources of supply will be the last preceding calendar month in which operations were carried on for two workweeks or more. If your establishment is performing the specified operations on the fresh fruits or vegetables for the first time, the period will be the total time during which your establishment has so operated until it has been in operation for such a calendar month.

You will note that this 95 percent requirement allows you a 5 percent tolerance which may be very useful in that it will enable you to claim the exemption in spite of the fact that you may receive an occasional shipment from a remote farm, or other distant supplier, or some other source which you are unable to determine.

You should determine the percentage of fresh fruits and vegetables received from normal rural sources of supply within the 15 mile distance by using such physical untis of measure as weight or volume. If however the different commodities which your establishment receives are customarily measured in physical units that are comparable, as for example bushels and pounds, you may use dollar value as the unit of measurement.

If it is apparent to you from the foregoing definition that your workers are not employed within the area of production as defined, you may nevertheless be entitled to other complete and partial exemptions from the overtime provisions of the Act (but not from its minimum wage requirements), for a total of 28 weeks in the calendar year. These weeks need not be taken consecutively.

One of these overtime exemptions applies for a period of not more than 14 weeks in the calendar year to employees of an employer who is engaged in the packing, canning or first processing of perishable or seasonal fresh fruits or vegetables. "First processing" is ordinarily the making of the first change in the form of the raw material. The freezing of peas, for example, is a first processing operation.

In addition, a limited exemption from the overtime provisions is provided for industries which have been found by the Administrator to be of a seasonal nature. The exemption is restricted to not more than 14 weeks in the calendar year. During the exempt weeks, payment of at least time and one-half the regular rate must be made for hours in excess of 12 a day or 56 a week. The packing, handling, storing, first processing, preparing in their raw or natural state, and canning

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## CRIPPLED, BUT NOT DISABLED

Not since the year of the "Big Freeze", perhaps, has the Florida citrus industry been harrassed by so many and so annoying ills as during the present season. Of course, we have had the citrus canker and the Mediterranean fruit fly which for a time threatened the very existence of the industry. But they were solitary dangers, single enemies to be met and conquered—as they were.

This season, the situation has been different. With the largest crop of citrus ever produced, we were first threatened by a tropical hurricane, which, providentially, passed us by with but little injury; then, through the early half of the shipping season, with unseasonally warm weather, the fruit refused to ripen and remained green and immature on the trees; shippers trying to "beat the gun" rushed much of this immature fruit to distribution centers, demoralizing the market and forcing the prices down below the cost of production; by the time cooler weather came to ripen the fruit, prices had reached an all-time low; then came the freeze of February 6 which destroyed a heavy percentage of the fruit still remaining on the trees, resulting in an embargo to add to previous annoyances.

With all these unfavorable conditions to contend with, it is little wonder that growers talked of chaotic conditions in the industry and faced the future with misgiving. But out of it all has come a determination to go forward with confidence and a united effort to solve our marketing and distribution problems, to the end that such chaotic conditions may never again afflict the industry.

That the growers are fully aroused to the necessity of united action in the solution of problems brought about by the natural, and man-made, conditions which have prevailed this season is evident from the activity of men connected with every element and every faction within the industry in consolidating the unity of purpose now so apparent and converting it into unity of action. With men like Tom Swan, John Snively, J. William Horsey, Charlie Walker, members of the Florida Citrus Commission and others taking the lead, every group within the industry is working toward the same end.

With such intelligent and aggressive leadership, backed by an aroused group of growers and shippers, the outlook for the formation of some organization, united in purpose and aggressive in action, is brighter today than it has been at any time in the past. The experiences of the present season have done more to unite all groups within the industry than any amount of oratory or cold logic could have done.

The Florida citrus industry has taken a severe beating—but it is not disabled—nor disheartened.

## COLD DAMAGE SEVERE

The freeze which visited most sections of the citrus belt on the morning of February 6 (and repeated on the morning of February 11) did a vast amount of damage to the Florida citrus crop, and in some sections to the trees.

The freeze was no respector of established rules, for in some sections normally considered "warm" the damage was extensive, while in some normally "cold" spots it is described as negligible.

Estimates vary exceedingly with location, and with the estimator, ranging all the way from negligible to upwards of fifty percent of the crop still remaining on the trees; and from no damage to fruit or bloom to killing of new growth and heavy damage to trees; The official preliminary Federal estimate is that fully twenty percent of the fruit on the trees, or 11,000,000 boxes, was a complete loss, while at least another ten percent was more or less damaged, and that there was considerable damage to trees. Most growers are inclined to believe that the Federal estimate is conservative, possibly too conservative. Even now, a full month after the initial freeze, a complete and accurate assessment of the damage is impossible. Certain it is that many groves will require extra care and attention if they are to quickly recover from the effects of the freeze and produce a normal crop in the years to come.

## HORSEY PROPOSES CITRUS COUNCIL

J. William Horsey, owner of extensive canning plants in Florida and elsewhere and president of a group of chain stores in Canada, has proposed a Citrus Council which would include in its membership not only members from the various branches of the industry, but also from chain and independent retailers, wholesalers, brokers, suppliers, transportation agencies, state government, packers, canners and growers.

The Florida Citrus Commission has appointed a man to cooperate in the movement and many leaders in the industry as well as many out-of-state handlers of citrus fruits, have indicated their willingness to join in the movement and aid in the formation of the Council.

"Let us enthusiastically join in a crusade to destroy the evil influences existing in this industry today and support sound principles that can protect and enhance the value of this great industry," says Horsey.

# Citrus Products Technology . . .

By J. L. HEID and C. G. BEISEL*
Florida Citrus Canners Cooperative
Lake Wales, Florida

Food Technology was one of the earliest arts practiced by primitive man. Capturing or finding his foods where and when he could, this hunter and forager was impelled by lean seasons to develop crude methods of preservation by salting, smoking, drying and cool storage, before he learned to cultivate plant and animal crops.

However, the development of agriculture outstripped that of food Technology, and it is only within the last ten years that the applied science of processing and distributing food products achieved the maturity of a national Institute of food technologists.

Basic foods may be conveniently classed as grains, fruits, vegetables, spices, nuts, condiments, meats, fish, poultry and dairy products. Methods for processing fruits and vegetables are generally similar and are ordinarily considered together. Within this field, citrus product technologists apply skills in horticulture, plant physiology, microbiology, enzymology, chemistry, physics, engineering, cooking, nutrition and related arts and sciences to the selection, harvesting, processing, packing and handling of citrus fruits and products and the utilization and disposal of residues and wastes.

Citrus product technologists find employment in many phases of production, control and research. The purpose of this discussion is to describe a suitable laboratory organization plan and review contributions of technologists to the development of the citrus products industry.

### Laboratory Organization

The organization of commercial citrus product laboratories should provide for:

**Research:** Many research projects are unique. Others fall into general classes as the investigation of varietal suitability for specific products and processes under local conditions, studies of the improvement of products, the reduction of costs, the development of new products, and nutritional factors affecting the marketing of products.

**Information:** The maintenance of an adequate technical file and library is essential.

**Engineering:** A function of citrus product technologists is to aid in developing and designing new and improved equipment.

**Personnel training:** Laboratory personnel desirably assumes responsibility for instructing and training technicians and plant test-station operators.

**Checking:** A related responsibility is the checking of operators, instruments, processes, supplies, raw materials and finished products.

**Advisory Service:** A major function of citrus products technologists is to furnish advisory service to business, production, advertising and sales management. This service may relate to such widely varied phases of the operation, as: The selection of varieties; harvesting and handling of raw materials; processing, packaging, storing and transporting products; plant sanitation; utilization and disposal of wastes; technical phases of contracts, patents, advertising and sales promotion; trouble shooting; customer service; handling of complaints, nutritional properties and the cooking, serving and acceptance of products.

### Commercial Developments

**General:** In Mediterranean countries lemon oil and citric acid were among the first citrus products which were prepared commercially (5). In the United States, marmalades, canned grapefruit segments and orange beverage bases were pioneering developments, (3,9) Carbonated beverages containing no fruit juice had been manufactured from sugar, acid, carbonated water, artifical color and flavors. Beverages made with orange bases contained concentrated orange juice equivalent to about five percent of juice which resulted in a corresponding improvement in quality. Pulpy lime, lemon and grapefruit juices were also used in this country and were exported for preparing rickeys and squashes. Later, imitation orange-ades, containing less than twenty percent of juice were prepared from bases containing added acid and artificial color together with concentrated juice.

In other early developments, citrus product technologists improved methods for recovering citric acid, essential oils and pectin from oranges and lemons. (25,27,30,32,33) These products were of higher purity than had previously been available. Costs were reduced extending the use of these products in the food and pharmaceutical industries.

**Juice Canning:** Technologists in State and Federal laboratories demonstrated methods for flash-heating citrus juices in high velocity heat exchangers. (6,14,15,17,18,20,21,31) However, kettle heating first came into general commercial use. Juice was permitted to come in contact with pumps, valves and tubing made from copper alloys. (4,8,28) Resulting canned juices were of inferior flavor and keeping quality.

It was not until copper alloys were removed from contact with the juice and stainless steel, aluminum and block tin were substituted, that the way was paved for further improvements in canned juice. (22,23)

High-velocity, turbulent-flow pasteurizers have come into general use for heating citrus juice sufficiently to instantly kill yeasts and spores and inactivate enzymes, without local overheating and scorching. Tubes of small diameter, flattened tubes, concentric tubes, partially plugged tubes, and plate-type heat exchangers are used to reduce the thickness of layers of juice through which heat must be transferred and avoid local overheating by providing a high degree of agitation. Maximum juice temperatures ranging from 205° to 240° F. are possible with less modification in flavor than occurred during kettle heating at 170°F.

Heated juice may be cooled

*Delivered to The Florida Horticultural Society at Miami, Florida, May 1, 1946.

rapidly for filling in cans by flash evaporation (in conjunction with de-oiling) or in a heat exchanger containing incoming juice or cooling water. Filling temperatures should be maintained above 170°F. unless facilities are available for sterile-filling, or the filled cans are given an additional heating.

**De-oiling and Deaerating**

The introduction of mechanical juice extractors permitted large scale packing of quality citrus juice products and brought new problems to the industry. One was the control of the quantity of essential oil incorporated from the peel. Citrus peel oil contains a large percentage of terpenes which tend to develop a rank flavor in canned juice held under ordinary storage conditions.

It was found that by heating fruit in steam, hot water or a flame, the quantity of oil in juice could be reduced (29). However, continuous commercial de-oiling deaerators were developed and are coming into general use. In this equipment juice is flash-concentrated and deaerated continuously by passing it through a high velocity tubular heater into a flash chamber maintained under a vacuum. This method represents modification of the analytical method used for determining the oil content of citrus juices and was tested upon tangerine juice in 1942 by Atkins and associates (1). Its success is based upon the fact that the least stable constituents of peel oil are also the most volatile. It is possible to remove three-fourths of the volatile oil from citrus juice by flashing it through a concentrator, returning condensed volatiles to the juice, while separating the water-insoluble terpene fraction. This process may be applied in two modifications. In the first, the juice is flashed through the de-oiler prior to pasteurization, emerging from the de-oiler at a temperature ranging from 120° to 140°F., and passing to a heat exchanger for pasteurization. In the alternate procedure, the juice may first be heated to 240°F. before flashing it through the de-oiling deacrator to a temperature of 185° for filling. Atkins and Moore report that the latter method possesses advantages for tangerine juice. (Personal communication.)

**Can Filling**

The quantity or oxygen in the head space of canned citrus juices has an important influence upon storage properties, particularly at unfavorably high storage temperatures. Reduction of oxygen in the head space by complete filling, by vacuum closing or by introducing steam or inert gas as can lids are applied, contributes measurably to retarding undesirable flavor changes during warm storage.

After closing, cans of heated citrus juice are cooled rapidly to minimize flavor changes. In conventionally designed coolers the cans are spun under sprays of water as they are conveyed through the cooler. Water may or may not be recirculated through a cooling tower. The cooler is usually designed for multistage operation, the coldest water spraying on the partly cooled cans, and passing successively to warmer stages counterflow to the cans of juice.

Whereas, temperatures as high as 115°F. were at one time considered satisfactory for labeiling and casing, the desirability of cooling canned juice to lower temperatures to protect flavor is generally recognized. Cooling to temperatures less than 100"F. is the rule. Methods are being developed to permit cooling cans below 80"F. before labeling and casing. This necessitates drying cans at high speed. Methods being used or tested for drying cans include the use of centrifugal force, wiping with heat-dried pads or towels, directing blasts of air against the cans, or passing them through a blast of flame, superheated steam or hot air. If cans are cooled to temperatures lower than prevailing wet bulb temperatures, labeling and casing rooms must be air conditioned, which imposes a practical limitation upon operations.

Storage temperatures of canned citrus juices affect the rate of deterioration in flavor and food value. Warehouse temperatures should never exceed 80°F. During summer months in warm climates, insulated warehouses may be closed in day time and ventilated by exhaust fans during the cool hours of the night, making it possible to maintain temperatures which do not ordinarily exceed 70° F.

Juice canned by best known methods and stored at temperatures below 40°F. shows little deterioration during twelve months. Refrigerated storage is finding some application in the industry. However, damage may be done to juice after leaving warehouses if stored for considerable periods at temperatures in excess of 85°F.

**Tangerine Juice**

Tangerine juice is difficult to extract in conventional juice extractors. Under unfavorable storage conditions the canned juice is subject to rapid deterioration. Reasons for the instability of canned tangerine juice are partially understood, and several methods are known for retarding flavor changes. This juice contains enzymes which cause rapid changes unless the juice is handled rapidly after extraction. It contains unstable volatile constituents which can be substantially removed by a flash boiling under vacuum. It contains less ascorbic acid and more easily oxidizable compounds than other citrus juices. For this reason, oxygen in cans should be minimized, and antoxidants may be added to protect oxidizable constituents. Compounds which have been used include ethyl caffeiate, sulfurous acid, iso-thymol and ascorbic acid, and related compounds. Skill is required for the proper use of antoxidants.

A reasonably satisfactory pack of tangerine juice can be prepared by extracting in equipment which avoids excessive grinding of the peel by handling the juice rapidly, adding antoxidant, heating to 240°F., flashing into a vacuum chamber and cooling by evaporation to 180°F., filling under conditions which exclude air, cooling rapidly and storing the canned juice at temperatures below 70°F., or better below 50°F.

Blending tangerine juice with juice of other oranges or citrus fruits also permits the packing of acceptable products.

**Utilization of Peel**

Heid (10), described methods for utilizing the peel in manufacturing dried citrus pulp and citrus final syrup. The complete utilization of the peel in making pectin, alcohol, oil (26), feed yeast, dried pulp and final syrup, is possible without creating odor of other nuisances. A bland syrup may be prepared from juice pressed from limed peel. In manufacturing this product this juice is heat-sterilized and filtered, after which it is passed through ion exchangers, concentrated to 40 to 50°F Brix and treated with activated carbon before final concentration. The resulting syrup compares favorably with refined corn syrup in appearance and taste, but manufacturing costs are higher.

**Dehydrated Orange Juice**

Spray-dried mixtures of lemon

juice and corn syrup, containing a high percentage of non-juice solids, has found a market for baking and other uses. Citrus product technologists have sought a method for dehydrating orange juice by which means a reasonably stable product could be distributed and reconstituted to the initial concentration to form an acceptable reconstituted orange juice. To accomplish this objective, it was necessary to develop methods which could be operated substantially without additives and to reduce the moisture content sufficiently to avoid deterioration of the powder during storage.

In 1942, Heid and Atkins investigated the drying of concentrated orange juice under vacuum and developed a method for preparing a granular material without any added spreader. Protected from moisture and oxygen, this product could be reconstituted to yield juice as palatable as that reconstituted from the concentrated juice from which it was prepared. The addition of small quantities of lactose to the initial juice made the dried product somewhat easier to handle without materially altering the taste. The method was adaptable for application in a vacuum drum dryer without a booster jet using unrefrigerated water for condensing vapors. A public service patent application was prepared and forwarded to the Chief of the Bureau in which the work was done.

At the 1946 meeting of the Institute of Food Technologist, Sluder and associates presented a description of work on a somewhat similar method in which a belt dryer was employed instead of a drum.

The cost of such methods of drying is less than drying by sublimation; however, sublimation-drying of orange juice may yield a product with a food value equal to and a flavor superior to that produced by simpler methods. Several laboratories have worked upon the development of equipment to permit the continuous manufacture of such products at competing cost. Commercial installations are in prospect.

**Concentrated Citrus Juices**

Orange, lemon, grapefruit and tangerine juices have been concentrated at pressures below atmospheric in circulating evaporators (1,2,7,11,16,21,24). The products have found a wide application in beverage and sherbet bases and more recently in the preparation of reconstituted juice. When orange juice of suitable quality is concentrated in properly designed and operated equipment, and the resulting product is stored at not to exceed 35°F., the food value of the reconstituted juice approaches that of the original closely, and the slight modification in flavor may be less than occurs in the flavor of raw whole fruit during distribution to distant consumers.

During the war, concentrated juice of this type was used in England to protect the health of nursing and expectant mothers and children under five. The effect upon death in child birth, and upon infant mortality and health furnished a striking demonstration of the potential value of this material in overcoming a nutritional deficiency of great prevalence (12). Dairies in the United States have undertaken to distribute reconstituted orange juice with milk, and this operation is meeting with success. Reconstituted juice is being served to an increasing extent in hospitals, army messes, drink stands and similar places. The fact that it is prepared from fresh, tree ripened fruit and distributed and stored at low temperatures has been a major factor in assuring quality and expanding markets.

**Frozen Citrus Products**

Orange juice may be preserved with little deterioration in flaver or food value for as long as five years if properly prepared, handled rapidly, quick-frozen in gas-tight containers, and held at uniform temperature not to exceed 0°F. Freezing rapidly and amorphously, and storing at uniform temperature, minimize flavor and texture changes. Gas-tight containers prevent dehydration and also oxidation by atmospheric oxygen.

The distribution of frozen orange juice has been limited because storage and distribution costs are high and it is difficult to train consumers to defrost the frozen juice in a manner to avoid objectionable deterioration in quality.

In order to overcome these difficulties, citrus product technologists have sought to develop methods for preparing frozen, concentrated citrus juices in which savings in weight and container requirements would tend to offset the cost of frozen storage, and which could be defrosted quickly and easily without flavor changes,—the water thawing the frozen concentrate and the frozen concentrate chilling the water so that the reconstituted juice


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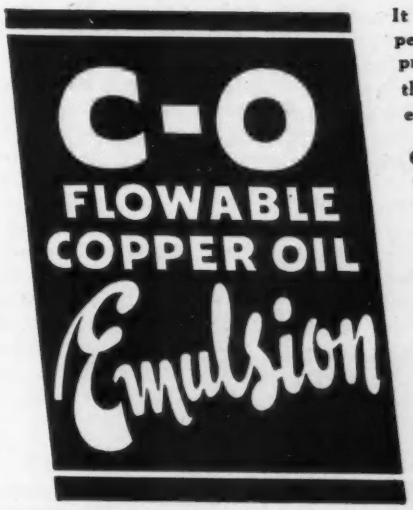


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would be ready to serve immediately.

Moore (24) and associates concentrated juice by rapid evaporation under a high vacuum at about 50°F. to 60 percent soluble solids and then added sufficient unconcentrated juice to reduce the solids to about 41 percent. When this concentrate was quick frozen in gastight containers and held at 0°F., it could be reconstituted into juice which tasters could not distinguish from the original. Equipment has been developed for preparing this product within a few minutes at nominal cost.

Commercial installations are being made for manufacturing and distributing this exceptionally fine frozen concentrate, and pending the availability of products of this type some manufacturers are mixing conventional concentrate with single strength juice and freezing the resulting mixture for distribution.

In the Linde-Krause procedure (10) fruit juices are concentrated continuously by separating frozen water upon a refrigerated drum from the juice flowing through a trough. The method is reported to give good quality two-to-one concentrations of clear fruit juices. Commercial application to citrus juices remain to be developed.

**Sanitation**

A major improvement in citrus juice canning has been in sanitation. Polished stainless steel equipment is designed and installed for close-controlled, straight-line production and easy cleaning. Glazed ceramic tile floors and walls, and glass block walls in juice extraction, processing and filling rooms, offer maximum resistence to attack by acid juices and cleaning agents. Forced ventilation with washed or filtered air, plus frequent and adequate clean-up of extractors and conveyors, plus careful storing and cleaning of fruit, make it possible to reduce micro-organism counts and insect contamination of products to a negligible minimum.

Inspection by State and Federal agencies is forcing protective measures into most plants.

**Fundamental Research**

Technologists of American citrus producing sections have organized a Citrus Products Research Council to foster, stimulate and coordinate fundamental research on citrus fruits and products. A major objective is to secure information which will permit extension of the storage life of canned citrus juices and related products (13). Studies of the carbohydrates, nitrogen compounds and enzyme systems are emphasized. Standards of identity and quality and methods of analysis are also listed for study. State and Federal agencies have undertaken projects in these fields.

Another research project of considerable urgency to the citrus products industry is the study of the composition of the liquid pressed from citrus cannery residue before it is dried. This liquid contains suspended solids and a series of compounds which coagulate when the juice is heated in the process of concentration to form a valuable feed syrup. This coagulation introduces problems of scaling in evaporator tubes and by determining the composition of substances precipitated at various temperatures, most advantageous methods of handling might be established. Knowledge is also needed of the composition of final syrup made from the liquid. Unpublished reports indicate feeding properties different from those of black strap molasses. It may be surmised that some of these advantages may be due to compounds with vitaminic properties particularly factors influencing capillary fragility and permeability. However a complete study of the nutritional and other properties of this syrup for use in feeds and in preparing beverage alcohol, would be of value.

Refined bland syrup and partially refined syrups can be prepared from this liquid by separating non-sugar solids, and some of these non-sugar solids may have important nutritional properties.

New citrus products in prospect include dessert and salad products incorporating low-methoxy pectin derivatives and concentrated juice products for home use in preparing juice and ades.

**Nutrition Research**

Citrus fruits and products are recognized as the richest and most stable source of ascorbic acid available to, and relished by, the American Public in equivalent quantities (12). Other nutritional properties are attracting increasing interest of investigators. When more is known regarding these factors, and methods of estimation have been developed, the evaluation of citrus products will become increasingly accurate.

**Summary**

Citrus products technologists are playing an essential role in the development and stabilization of one of the fastest growing food processing industries.

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# Citrus, Dairy, Wool Advisory Comm. Named

The Department of Agriculture has announced the formation of three additional commodity advisory committees to assist the Secretary of Agriculture and the National Advisory Committee in the development of plans and work in connection with the Research and Marketing Act of 1946. The new committees represent the citrus, dairy and wool industries.

These committees, along with the cotton committee announced February 20 and others to be announced soon, will first study the need for new research and marketing services in their respective commodity fields. The committees' recommendations will be used as a guide in shaping plans for expansion of Federal-State research and marketing activities as soon as Congress grants funds now authorized.

Members chosen to serve on the citrus committee are as follows:

A. V. Saurman, grower, Clearwater, Fla.; J. Wayne Reitz, economic counsel, United Growers & Shippers Ass'n., Orlando, Fla.; Raymond D. Robinson, vice-president, Dr. P. Phillips Canning Co., Orlando, Fla.; F. R. Wilcox, ass't. gen. mgr., California Fruit Growers Exchange, Los Angeles, Calif.; Robbins Russel, ass't. gen. mgr., Mutual Orange Distributors, Redlands, Calif.; W. H. McCracken, president, Treesweet Products Co., Santa Ana, Calif.; G. O. McDaniel, grower-processor, Edcouch, Texas; Alden M. Drury, gen. mgr., Texsun Citrus Exchange, Weslaco, Texas; W. F. McArdle, Wesco Foods Co., 1425 S. Racine St., Chicago, Ill.; L. V. Eberhard, distributor, 1146 Wealthy St., Grand Rapids, Mich.

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Tests by the USDA laboratory at Orlando have shown that nitrogen is absorbed by Florida citrus trees at all seasons of the year, the lowest intake being in January and February.

# Orange Juice Better Than Vitamin Pills...

Orange juice, and cod liver oil and the sun's beneficial rays are better than vitamin pills and "shots" in treatment of most persons suffering from nutrition deficiencies, the Army's wartime nutrition director believes.

Dr. John Barlow Youmans, dean of the University of Illinois College of Medicine, who during the war was director of the nutrition division in the preventive medicine service of the Army surgeon general's office, told a group of doctors in Washington, D. C., recently that greater attention should be given to preventive measures and simple remedies in treating nutrition cases.

A Washington newspaper (The Evening Star) reported that Dr. Youmans stressed the importance of a doctor training his patients to develop proper eating habits as a guard against recurrence of vitamin dificiencies, rather than seeking merely to provide temporary relief through use of concentrated vitamin prescriptions or intravenous injections.

# Concentrated Orange Juice Purchase Program Ends....

The U. S. Department of Agriculture has announced completion for the fiscal year 1946-47 of its purchase program in Florida of concentrated orange juice for use in the National School Lunch Program.

Department officials reported total purchases included 755,386 gallons, all during the months of January and February, 1947. Purchases were made with funds authorized under Section 6 of the National School Lunch Act.

Domestic demand for dairy products is expected to continue strang through the first half of 1947 and then decline slightly.

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## Reports Of Our Field Men . . .

### SOUTHWEST FLORIDA
**Eaves Allison**

The west coast section was very fortunate in escaping damage from the recent spell of freezing weather which swept most of the state. Temperatures here did not drop to the predicted low at any time, remaining about the danger point with no damage resulting to citrus fruit crops, bloom or tender growth. Celery, hardy truck crops and gladioli escaped with little or no cold damage. Cold winds burned some foliage here and there and occassional groves are dropping some leaves from this cause. These leaves did not curl and dry up, but simply became brittle at the petiole and fell off. Pole beans and cucumbers were killed in practically all locations. In the DeSoto and Hardee County sections there was some damage to citrus, and in some spots bark and wood showed the effects of extremely low temperatures. On the whole citrus losses here could probably be called moderate although tender truck crops were almost a total loss.

### POLK COUNTY
**J. M. (Jim) Sample**

The recent cold did serious damage to the citrus crop in the County. While the damage could not be considered as very general, it was very severe in some locations while in other areas there was little damage. Growers that were in position to fire in an adequate manner brought their properties through in good shape. Young trees were hurt in most all locations and in many instances they will have to be pruned back to the bank. The heavy winds on Wednesday the 5th was responsible for quite a heavy loss of fruit. This was especially true in the case of grapefruit and of course there also was some orange loss. Tangerine trees suffered very badly from the cold and this was particularly true where the crop had not been moved from the trees. Damage was very slow to show up in the fruit due to continued cool weather and good rains. However, at this time fruit is beginning to break down and considerable dryness is evident.

### NORTH CENTRAL FLORIDA
**V. E. (Val) Bourland**

If we had to have a freeze this was the year for it to happen is the general consensus of opinion in this territory. The market was in a very depressed condition and in many cases fruit was being moved from trees at a price that did not give the grower cost of production. Well we did have a freeze and I am of the opinion that it should not happen even with low prices being paid for fruit. We not only have fruit damage but considerable wood damage. As is generally true when we have a freeze, this one was of a different pattern from most of those during the past. What appeared to be or is considered cold spots suffered little damage in many cases while other areas thought to be warmer were badly damaged. In many areas there was no damage at all, not even young trees.

### HILLSBOROUGH & PINELLAS COUNTIES
**C. S. (Charlie) Little**

This territory was very fortunate during the recent freezing weather that covered most of the state. We came through in fine shape with practically no damage. In fact we have bloom and new growth that was not touched by the cold. Since we were so fortunate in this territory by not having any fruit damage most growers are planning to hold their fruit until damaged fruit from other parts of the state has been moved. We have been going forward with our spring topdresser application and many groves throughout the section are putting on a very nice bloom. We have had plenty of rains and our trees are in excellent condition for setting a nice crop of fruit for the coming season.

getting their spray program under way and will follow this through the season. In a few instances it was impossible to get on dormant sprays because wood was in the grove, but in these cases a post bloom spray will be applied just as soon as is possible.

### SOUTH FLORIDA AND HIGHLANDS COUNTIES
**R. L. (Bob) Padgett**

We are moving quite a bit of fruit from this section, and most of it should be thrown to the ground for it is being picked from damaged areas. The recent cold did varying damage in different localities. In some sections we did not have bloom or new growth touched while in other sections the loss was severe with much fruit damage and some wood damage. Fruit has been very slow in showing a break down, but it is now very evident, and the general consensus opinion of growers in this section is that the loss of fruit will be as high as thirty five percent. We have had plenty of rain during the past few weeks and groves are beginning to bloom. This is especially true in the case of grapefruit. Many growers are giving their properties an application of topdresser at the present time and are doing a thorough job of cultivation. We have had quite a loss of foliage on young trees.

### WEST CENTRAL FLORIDA
**E. A. (Mac) McCartney**

The cold damage to this territory was an in and out proposition. In other words, we were damaged in some sections and in other areas the damage was negligible. We have some frozen fruit and we have some damage to wood on young trees, but taking the whole territory into consideration we came through with considerably less loss than was at first anticipated. Hernando County is becoming a very diversified agricultural center and this year we have approximately 300 acres of sweet potatoes being grown for processing by an organization headed by Mr. Frank Stelmhole, who we predict will do an excellent job and become an asset to the agricultural interests of not only Hernando County but to the entire area surrounding this county.

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It's a funny thing when anything goes wrong with our business we always look around tryin' to find somebody else we can blame for the trouble . . . just like now in the citrus business. Like everyone else we tried to git as much of our damaged fruit marketed as possible just as soon as the embargo was lifted . . . we didn't git away with it, but we tried . . . we didn't deserve to . . . and it's jist as bad for this kind of fruit to be put into cans.

We are makin' this confession just three days after the embargo was lifted and in those three days we've been over a large section of the citrus area of the state and everywhere we went we saw pickin' crews at work tryin' to git this frosted fruit off the trees and some how or other to git it marketed . . . On a lot of trees that was whole defoliated we saw pickin' crews goin' to town.

As a matter o' fact it don't make no difference whether this sort of fruit was sent to packin' houses to try to git by the inspectors and git to market or whether it was put into cans we shore ain't doin' Florida citrus fruit no good with the folks we got to depend on for the future market of our fruit. Sometimes, to put it mildly, looks like we don't use our heads for much 'cept to put our hats on.

As we went over the state we heard this group and that group criticisin' each other for demoralizin' the market . . . we heard individual growers criticisin' each other . . . but we have come to the conclusion that it ain't the packer, nor the grower, nor the speculator, nor the canner whose responsible for our plight . . . we're all equally guilty, and until we all decide that it's the business-like thing to cooperate together trying to operate things so that each of us can git a share of the profit to be made, instid of each of us tryin' to knock off a few more pennies for ourselves, the industry is goin' to be in a hell of a fix.

One thing the recent cold spell did was to show growers that groves which was fertilized with complete fertilizers havin' ample amounts of secondary plant foods came through the freeze in a heap better shape than those that was followin' sort of a haphazard program . . . magnesium is one of the cheapest and most effective of the secondaries that helps trees withstand the cold, as was proved in this cold spell. I'd definitely recommend that plenty of magnesium be applied to all groves to keep 'em cold resistant as possible . . . your fertilizer man can help you in seein' that this is done. Irrigation also proved itself in a big way as protection against cold damage . . . those groves that was well watered came through with a heap less damage than others.

***Uncle Bill***

# National Food Handlers Will Help Market Florida Citrus Crop

At the invitaton of J. William Horsey, president of the J. William Horsey Corporation, one of the leading canners of citrus fruit in the state, a number of national food distributors have agreed to join in the formation of a council for the expansion and orderly marketing of Florida's citrus crop.

In response to telegrams sent to state and national food distributors, including chain and independent associations and leading wholesalers and marketing agencies, Mr. Horsey has received assurance that his program meets with hearty approval.

In telegrams inviting these leaders to participate, Horsey said the Florida Citrus Commission had approved the plan to set up the council, to be made up of outstanding executives from all branches of the industry, including retailers, chain and independents, wholesalers, brokers, suppliers, transportation, state government, and two each to represent packers, canners and growers.

The situation in the citrus industry is serious, Horsey said, and the council will be asked to meet as soon as possible to consider the whole citrus problem, present and future, "and to develop suggestions for quality control and orderly marketing".

Horsey, who became chairman of the board of Apte Brothers Canning Co., of Tampa in the Fall of 1945, is now president of the J. William Horsey Corporation, Tampa, operating five fruit and vegetable canneries in Florida, Georgia and Deleware.

He is a former president of Standard Brands, Ltd., of Canada, and is president of Dominion Stores Ltd., operating 250 food stores in Canada. He also is head of a bakery chain and is vice president of a milling concern.

**Urges Cooperation**

Horsey called the attention of Florida people to the critical need of cooperative effort to sell citrus in advertisements now appearing in Florida publications in which he declared the industry, biggest in Florida, must not be sabotaged "by apathy, rugged individualism or selfishness".

The solution of Florida's citrus troubles, he said, is not in Florida, but in the markets of the world and on the tables of those who need it.

"If we are to protect and develop this great industry there is no room for the free play of the destructive tactics now rampant but plenty of room for cooperative effort," Horsey said in his advertisements.

"If it is to survive and move forward to greater and more creditable achievement, men of honest purpose, vision, and a will to act constructively must band together to plan soundly and courageously.

"Effcient production and distribution of high quality citrus products should be our objective. The deplorable condition existing today is the result of ineffciency and negligence, dull perception and a refusal to face obvious fundamental facts."

**Production Increase**

Pointing out that the production of citrus in Florida had increased from 48,000,000 boxes in the 1941-42 season to an estimated 100,000,000 boxes this year, Horsey said there never could be a surplus of good food.

The present troubles in the industry is not due to over production, but to "apathy, to the lack of intelligent and decisive action on the part of the industry itself."

The United States and the world have not yet had all the citrus they want or need, he wrote, but Florida does not have an effective way to get it to those who want it.

"The solution is not in Florida," he wrote. "It is in the markets of the world. It is on the consumer's table. Let us start there and work

(Continued on page 26)


## No Freeze Damage

**By heavy and continuous firing of our nursery and bearing avocado groves we brought them through the recent cold spells without any injury whatever. Even the most tender avocado blooms and new growth on Temple nursery trees were not injured.**

**At present we have a limited number of nice sized nursery trees for replants of the following varieties:**

**Hamlin, Parson Brown, Valencia and Temple oranges.**

**Duncan and Marsh Seedless grapefruit.**

**A fine selection of nearly all standard varieties will be available for June planting. Orders being booked now.**

## Ward's Nursery

**Avon Park, Florida**

# MEN Make Swift's Growers Advisory Service VALUABLE!

• Yes, men . . . conscientious, well educated, properly trained for their particular job are the backbone of the special service Swift & Company offers you. It has been traditional with us to train men in the Swift way ever since Gustavus Swift, our founder, proved by experience that it was the safe method of assuring Swift & Company customers the efficient, high caliber service they deserve. Because men are the essence of any organization we want you to know the men of Swift's GROWERS ADVISORY SERVICE.

• It is our plan to introduce each month, through these columns, a member of our Growers Advisory Service Staff. Some will be familiar to you because they service you or your neighbor. Remember, Swift's Growers Advisory Service brings the advantages of the special training and years of experience of all of these men to you!

• PAUL B. HUFF—Mr. Huff came to Swift & Company some years ago with the educational qualifications for a top-notch Florida citrus service representative. He is a graduate of the University of Florida with a degree in Agriculture. He had also spent several years with the U. S. Department of Agriculture. This educational background and experience plus the additional training and practical experience in Florida groves and fields since coming with Swift & Co., has given Mr. Huff a thorough understanding of the cultural and feeding requirements of Florida citrus crops.

• Grove owners praise Swift's Growers Advisory Service because they know all recommendations are made by such men as Mr. Huff, and are the result of regular periodic scientific inspections and study of the needs of their groves. Swift's long experience and research in citrus culture have proven that regular and constant inspection of groves is necessary in order to be able to prevent and correct plant food deficiencies and recommend other cultural practices which will assure maximum yields of high quality fruit at a minimum cost.

Today, with lower market prices, it is more important than ever to follow the best cultural and feeding practices. You need the extra quality and the lower growing costs such practices can bring you. Let us explain how Swift's Growers Advisory Service can help assure you better profits.

Write to:

## Swift & Company • Plant Food Division

Winter Haven, Florida

# The Growers' Own Page

**This department is devoted to the growers, for their use in giving expression to their views and a discussion of growers' problems. Any grower is welcome to make use of this department for the discussion of topics of interest. The only requirements are that the articles must be on some subject of general interest, must be reasonably short and must be free from personalities. The editor assumes no responsibility for views expressed, nor does publication imply endorsement of the conclusions presented.**

## TREE RIPENED FRUIT

February 5, 1947
Glenwood, Florida

Mr. S. L. Frisbie, Editor,
Citrus Industry,
Bartow, Florida.

Dear Mr. Frisbie:

I have read with interest a letter from Mr. Frank R. Schell in the February issue of The Citrus Industry on the subject of "color added oranges." I do not know Mr. Schell and I respect his viewpoint but I thoroughly disagree with him.

Before I became a grower, I was a consumer of oranges as well as a buyer of oranges. There were four husky children in our family and I purchased a lot of oranges, but I never bought a color added orange and I never shall. To me a color added orange for eating purposes is an abomination, just like a colored wax banana.

To argue, as Mr. Schell does, that green, dyed fruit is equal in eating qualities to mature tree-ripened fruit is pure, unadulterated nonsense, as any one who has eaten tree-ripened fruit knows. And whether we eat a Hamlin orange or a Valencia orange it tastes better and is better when it has reached maturity than when it is picked green and then colored.

Mr. Schell says, . . . "are doing an incalculable harm by leading consumers to believe that Florida uses artificial "ripening" processes that are deliterious to their flavor and keeping qualities." Are we to assume that Mr. Schell believes that treating oranges with heat and gas in a closed room for twenty-four to forty-eight hours improves their flavor and keeping qualities?

Has it ever occurred to Mr. Schell that the reason the basket trade advertises tree-ripened fruit may be because they have found by experience that the public wants tree-ripened fruit? It costs money to advertise and the grower who sells his fruit by mail is not likely to remain in business long unless he can give the public what it wants. I doubt if Mr. Schell will find in all of Florida a mail order dealer who advertises tree-ripened fruit for the purpose of doing "incalculable harm" to the citrus industry. I am not convinced that such advertisers do harm anyone. They are more likely to benefit the industry by giving their customers their first opportunity to taste Florida citrus at its best.

Would it not be a good idea to make an extensive consumer survey in the largest markets to ascertain what the consumer really wants? I know quite a large number of consumers, but I don't know any who prefer their oranges cooked and dyed before the oranges are purchased and eaten.

I do not think the ostrich policy recommended by Mr. Schell will ever gain consumer acceptance or create consumer goodwill. I think the consumer is well enough informed and intelligent enough to know what he wants and to insist on getting it. I have never known of any way to fool the consumer indefinitely or of making him buy or consume what he does not like nor want. I could be wrong, but it is my observation and belief that the consumer emphatically does not want cooked and dyed oranges and knowing this I would be a fool to try to sell them to him.

Sincerely,
H. G. Zimmerman

## CITRUS AND THE PRESS

There was a slight tiff at a meeting of the citrus commission in Lakeland the other day that highlights a fairly general attitude of many special interests toward newspapers.

In this particular instance, during a peppery verbal exchange between Latt Maxcy, of Sebring, and C. C. Commander, of Tampa, Maxcy objected to a remark by Commander concerning the poor quality of some canned citrus juice.

"It's fine for these newspaper boys," Maxcy said, "but we've knocked 25 cents a box off our fruit because we cussed it."

Before proceeding, let me say that this is not a personal dig at Latt Maxcy. His name is used simply because he is the latest to have blamed at least a part of the citrus industry's troubles on the press. A number of other citrus men have said the same thing in different words this Fall and Winter.

The weakness of their argument is this:

They do not deny that there was a record crop of citrus on the trees this season, nor do they deny that some growers and shippers, in ill-advised attempts to beat the competition to market, have shipped inferior fruit. But instead of charging those factors with responsibility for low prices, they shift the blame to the newspapers for having reported the facts.

(Be it said to the credit of many others in the industry that they have asserted that the first step in solving the problems of the 1946-47 citrus deal is to air them thoroughly.)

Similarly, there have been other individuals and groups, notably the directors of the Tampa Chamber of Commerce, who have been outspoken in condemning Florida newspapers for focusing attention on the sorry plight of Florida's educational system.

The theme of their plaint has been that "this bad publicity will cost us thousands of dollars in tourist money. Who would bring their children to a State with such poor schools?"

The answer to such denunciations is that, although the same un-

**We Thank You...**

**Your patience during the trying period of the War is appreciated.**

**Resumption of Peace Time Service will come to you as rapidly as possible.**

**Florida Telephone Corporation**

**Serving 14 Counties in Florida**
**Headquarters: Leesburg, Fla.**

healthy conditions have existed for years, public interest remained so dormant that no organized effort has been made to find remedies. The facts have been right there, waiting to be uncovered, but since no one took the trouble to call them to our attention, we have moved placidly along ignoring them.

With the schools, the harm done by poor instruction was not realized until Florida graduates entered into competition with better prepared graduates from other states. We have been doing our children an injustice in not equipping them properly—but it took the spotlight of publicity to rouse us to sufficient anger and energy to demand remedial legislation.

With citrus, oversupply and poor quality have been gradually undermining the market for a long time. Despite the cries of scattered voices in the wilderness, no concerted effort to correct defects in the marketing set-up was made until the chickens came home to roost—and the printed word pointed out why.

Among the many suggestions that have been forthcoming in recent weeks, one of the soundest is that of Dr. P. Phillips, of Orlando, that the advertising tax on oranges be doubled to carry the citrus sales story direct to the consumer.

Salesmen in practically every other line of endeavor discovered long ago that unless the ultimate consumer, the guy who in the long run pays all the bills, wants and demands a certain product, that product will stay in the hands of its producer until it falls apart from neglect.

—Loyal Frisbie

## U. S. DEPARTMENT OF LABOR WAGE AND HOUR CONTRACTS

(Continued from page 9)

of perishable or seasonal fresh fruits and vegetables have been found to be branches of a seasonal industry and entitled to this exemption.

As a result of these two 14 week exemptions, you can readily see that when you are not within the area of production, you may very well be able to handle your full season's pack with very little extra pay for overtime, even though you must comply with the minimum wage provisions.

It is suggested that if you have any questions concerning the applicability of the Act or the exemptions from its minimum wage and overtime provisions, you should contact your Regional Office of the Wage and Hour and Public Contracts Divisions, United States Department of Labor.

The regional Wage-Hour Offices are located at Atlanta, Ga.

Eleven quarts of Florida W-1 corn wer edistributed recently among Hardee County 4-H club boys for demonstration plantings of the crop, according to Earl Rodgers, assistant county agent.


# Vigilance...

**The Combination of several unusual conditions in the citrus industry may have a tendency to cause growers to relax their vigilance in the care of citrus groves.**

**In reality, MORE ATTENTION will be necessary this year than in some years past if groves are to be maintained in top condition.**

**Be sure YOUR trees receive the care and feeding they require.**

**Ask the NACO man for any help you may need.**

NACO FERTILIZER COMPANY JACKSONVILLE 1 .... FLORIDA

## RESEARCH NEEDS IN THE CITRUS INDUSTRY

(Continued from page 7)

prior to storage of press liquor. Variations in composition and pH are of greatest immediate importance because of different uses for the syrup and because of undesirable chemical reactions which may occur in storage tanks of customers when syrups from two manufacturers are mixed.

**The Development of New Products**

The development of new products will always be an important research need of the citrus industry. Nothing stays the same; and only by looking ahead can any industry avoid obsolescence.

At present, a new citrus product which promises to become important is frozen concentrated juice. It is well known that citrus juice can be preserved for long periods by uniform frozen storage in gas tight containers. However, container, storage and distribution costs are high; and it is difficult to defrost frozen juice without impairing quality.

To overcome these objections research workers of the Florida Citrus Commission investigated the possibility of preparing three-to-one and four-to-one concentrated orange juice products which could be distributed in frozen form and could be reconstituted quickly and easily, the water thawing the concentrate and the concentrate chilling the water so that juice can be prepared for serving without damage to flavor or foo dvalue. Four-to-one concentrate was prepared by mixing approximately equal volumes of single strenght juice and 65 degrees Brix concentrate prepared by evaporation at temperatures below 60 degrees F.

Commercial operators and equipment manufacturers have worked together in developing special processes and equipment to manufacture this product continuously at nominal cost, considering the engineering problems which are involved. Although abnormal conditions in the equipment industry have retarded commercial operations, the prospect is that increasing quantities of these new, superior concentrates will be available in the not too distant future. Samples of products have been universally greeted as the best yet available for public serving where flavor is a primary object. It may be anticipated that this will be a fancy product at a premium price.

At the Univeristy of Florida, work is being conducted on the possibility of developing commercial methods for preparing concentrates for frozen distribution—by separating water from juice fractionally by crystallization. Continued research in this field and investigation of the possible value of the Linde-Krause procedure, developed in Germany, may result in developments of advantage to the citrus industry.

Research is needed on the possibility of developing other new processes and products which will use substantial quantities of citrus fruit in products to aid in stabilizing the marketing of citrus crops.

**Conclusion**

In this discussion of research needs of the citrus industry, your speaker has endeavored to summarize a few points of importance. A subject which might have been mentioned is the need for a more comprehensive abstracting of current literature of food technology. This subject was discussed in the **Fruit Products Journal** for November 1945.

In today's discussion emphasis


PUT VIGOR AND HEALTH INTO YOUR TREES

Through the liberal application of Florida Favorite Fertilizers . . . many trees are depleted of their normal strength at this time, and nothing will do more to build health and strength into such trees than the proper application of our good fertilizer.

Trees that now appear healthy can be made more proficient, too, through this same method . . . and Florida Favorite Fertilizers provide just the right proportions of good plant foods, with ample amounts of needed secondaries.

Remember, too, that we deliver your fertilizer to your groves in our own trucks just when it is needed.

Florida Favorite FERTILIZER, INC.

Old Tampa Road Lakeland, Florida

was placed upon the promotion of the nutritional importance of citrus fruits and products. Recently, your speaker attended a national meeting of dietitians at Cincinnati, at which reconstituted orange juice was demonstrated. While the American dietitians were familiar with the uses and properties of the product and with its high retention of vitamins, a dietitian from England proved to be the most enthusiastic booster. She sampled the product several times each day, consuming generous servings while discoursing enthusiastically upon the record in War-Time England. She knew that the concentrate was rationed to nursing and expectant mothers and children under five, and that despite abnormal war-time living conditions and restrictions on medical, hospital and nursing care, death in child birth and infant mortality dropped to an all time low and infant health achieved an all time high.

I could not avoid the conclusion that the technical people of the citrus industry have fallen down on the job of furnishing ammunition and moral support by ballyhooing the virtues of canned citrus products.

## Mexican Fruitfly Permits Required Again

The U. S. Department of Agriculture has announced that permits will be required for the movement of citrus fruits, effective 12:01 a. m., February 10, from the area in Texas regulated on account of the Mexican fruitfly. Permit requirements were temporarily suspended on October 1, 1946, with the understanding that their use would be resumed upon the finding of adult egg-laying Mexican fruitflies during the current season. Because of the recent finding of a small number of such flies it is deemed advisable to resume the permit requirements, which will remain in effect as long as there is danger of dissemination of the insect through interstate shipments of regulated citrus fruits.

The price situation, labor shortages, and some difficulty in obtaining the grades of fertilizer they wanted will result in Lake County growers planting less watermelon acreage this season than they had last year. County Agent R. E. Norris estimates 1947 plantings at between 10,000 and 12,000 acres.

CROPS ARE ROBBERS

Sul-Po-Mag returns essential MAGNESIUM the "natural" way

All plants steal magnesium from the soil. Since the civil war, it is estimated, crops have removed from 6 to 25 lbs. of precious magnesium per acre. To learn the full story about magnesium and its vital importance —how it can be restored in the most practical and economical way, read International's new booklet, "Magnesium — An Essential Plant Food Element."

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WATER-SOLUBLE SULPHATE OF POTASH-MAGNESIA

FREE! Functions and benefits of Magnesium are described in this booklet.

Sul-Po-Mag, mined by International at Carlsbad, New Mexico, is nature's own blend of Potash and Magnesium. Both the potash and the magnesium are in water-soluble form and immediately available to crops. The value of magnesium, in this practical, convenient and economical form, has been firmly established by extensive scientific tests and experimental plantings. Many farmers now using Sul-Po-Mag in mixed fertilizers and in direct application, report these benefits: *Higher yields! Healthier crops! Earlier maturity! Greater acre value! Increased fertilizer efficiency!*

Write the International office nearest you for your free copy of the booklet, "Magnesium — An Essential Plant Food Element."

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61 BROADWAY, NEW YORK, N. Y.; VOLUNTEER BUILDING, ATLANTA, GA.

## PROGRESS OF CONTROL MEASURES AGAINST WHITE-FRINGED BEETLE

(Continued from page 3)

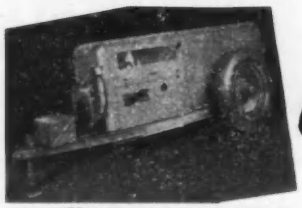
Between 1936 and 1946, numerous inspection surveys seeking to find the beetle in Georgia were made by state and federal inspectors, with negative results. However, in April 1946 the beetle was found on a property located near Fort Valley, Georgia. This finding was reported to the Georgia officials, and a statewide survey started immediately afterwards disclosed the fact that the white-fringed beetle was present in at least forty counties in Georgia. Furthermore, it was learned that balled and burlapped plants, an excellent medium fo rspread of white-fringed beetle, had been moved from two infested nurseries into other southern states, Florida included. There is evidence at hand to support the belief that white-fringed beetle has been present in some counties in Georgia for at least ten years. This takes us back to 1936, the year when, as the result of the finding of white-fringed beetle in west Florida, it was officially announced that a pest new to and not widely disseminated in the United States had been found. This statement is partly true, for prior to that year there were no records of the presence of white-fringed beetle in the United States. But in the light of information concerning its distribution developed since 1936 it is probable that the initial finding was not made in or close to the center of a comparatively small infested area, but was actually on the southern fringe of a rather extensive area overlapping into several states.

So much for the progress made in preventing dissemination of white-fringed beetle. Now we will mention the progress made in the development of control measures for the purpose of reducing crop injury likely to follow attacks by the pest. We believe, thanks to the efforts and work of Mr. Hiram Young, Entomologist of the Bureau's white-fringed beetle research laboratory at Florala, Alabama, and Mr. J. Lee Smith, District Leader attached to the Florida Agricultural Extension Division, that great advances have been made along these lines. The adult weevil deposits its eggs on almost anything on or close to the ground. Newly hatched grubs burrow into the soil and feed upon the roots of plants. Several hundred wild and cultivated plants are known to be attacked in diftion of the pest from over a hundred thousand acres of wild and cultivated lands located in six widely separated states is an impractical task. As the time of emergence of the adult weevil coincides with the advent of our rainy season, poisons applied to ferent degrees of severity. Eradicaplants to kill the adults are washed off before they have time to be effective. Costs for a number of applications sufficient to reduce adult populations to any appreciable extent would be prohibitive. Control of the larval stages, which are found in the soil, it always a difficult task. However, Mr. Young soon learned that plants, such as grasses, with numerous fine roots were unaffected by the weevil, and suggested that through the adoption of a crop rotation or selection program, in which the use of such crops was involved, farmers would be able to grow the more susceptible crops such as peanuts without undue losses. Mr. Smith saw the advantages of such a plan, both as a means of reducing crop injury and as measures to improve the soil and to increase the cash returns to farmers. Working with his County Agents in Walton, Okaloosa, and Escambia Counties, meetings were held and the need of and reasons for the program explained to farmers in attendance. The results have been very satisfactory. Blue lupine is planted in the fali as a winter cover and soil improvement crop. A large acreage is planted each fall to oats, and farmers for the first time have

**WHEN TREES GROW ON TELEPHONES**

We always try to route our telephone lines to avoid trees. During storms, trees or heavy branches fall on our lines, sometimes wrecking them and severely disrupting service. We will be grateful for your co-operation in any necessary tree trimmings and your selection of line-free locations for new plantings.

PENINSULAR TELEPHONE CO.



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A size and type for every job.

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- Full range of sizes and capacities to assure complete penetration and coverage of foliage.
- Streamlined design for easy passage in rows; elimination of twig breakage losses.
- Rugged construction for economical operation; minimum upkeep.

*Dust and Spray the* **IRON AGE** *Way*

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Tavares, Florida

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Miami, Florida

winter pastures and grain for live stock. Neither lupines nor oats are attacked by the white-fringed beetle. Thus, through the development of a sound cultural program crop losses have been reduced, while at the same time there has been an improvement in the soil, as well as in the economic conditions of farmers in the quarantined areas. The results have been so striking that farmers in infested areas in other states have adopted the program recommended by Mr. Smith and Mr. Young.

In the meantime Mr. Young turned his attention to the development of some effective means of killing the larvae in the soil. DDT suggested itself as an admirable material for this purpose, and a great amount of experimental work with regard to the lethal dosages of DDT required, the effect of the material on plants, and other essential information was performed by Mr. Young and his assistants. It is now known that in amounts varying from five to ten pounds per acre, DDT will kill up to 90 percent of the larvae. In small laboratory experimental plots and in large-scale field demonstrations some very excellent results have been obtained.

While it would appear that a combination of crop rotation, or selection, and DDT is likely to solve the white-fringed beetle problem in areas where general farming is practiced, quarantine officials are not yet prepared to revoke the quarantines and leave to the farmer in infested areas the task of combating this pest. It is known that Irish potatoes may be severely injured by white-fringed beetles. In experimental plots, tobacco plants proved to be very susceptible to injury. Ommediately following the discovery of the pest in west Florida, the State Plant Board constructed a small greenhouse at Florala and sent in a number of potted citrus trees in an attempt to learn if the insect would injure this crop. No apparent injury was noted. However, it is stated that in Georgia young peach trees were killed as the result of larvae gnawing the roots of the trees. Similar injury may result to citrus in the event the pest becomes established in our citrus belt. No information is available as to the susceptibility of celery plants. So there is much to be learned before state and federal quarantine officials are willing to revoke the quarantines and expose other crops, particularly truck crops, to invasion.

In conclusion, and for the benefit of our growers located in central and south Florida, we will state that surveys made in South America by federal officials for the purpose of obtaining information as to the habits and hosts of this insect in what is believed to be its native home, developed information that leads us to believe that the infestation in the northern parts of Okaloosa and Walton Counties is situated on the southern range of the pest, and that climatic conditions even a little further south in Florida are unfavorable for the existence of white-fringed beetle.

# Control Of Home Garden Insects

By the late, J. R. Watson, Entomologist, Florida Experiment Station.

At this season of the year strawberries are in full bearing and divers insects are taking the usual toll. One of these is crickets. They are particularly apt to attack strawberries that are on a heavy mulch under which they can hide in the daytime. They attack the ripening berries, eating out a hollow, usually on the lower side.

Crickets will take readily to this grasshopper bait: 1 pound of paris green or 1½ pounds of calcium arsenate in 25 pounds of bran. The bran and the poison should be thoroughly mixed, then the whole moistened enough to make it flaky but not sloppy, which calls for about 1½ gallons of water. Somewhat better results are often obtained by putting a quart of syrup in the mixture. The syrup and a small handful of salt can be placed in the water with which the mixture is dampened.

Other pests have appeared on the strawberry plants. One is the pamera. There are three species of them. They belong to the chinch bug tribe and have the same odor and the same shape, but are longer. The young are reddish brown in color, resembling in this respect, some ants, but they are much more rapid in their motions than the ants. When disturbed, they scamper off in all directions. They are sucking insects. They will cause the plant to wilt and, if the infestation is sufficiently severe or long, to die. The best control for pameras is a pyrethrum compound, but at the present time pyrethrum is very scarce. And the compounds are of rather poor quality—that is, their pyrethrum content is low.

DDT has given good control of the pameras, either as a spray or as a dust. The dust is better during the bearing season as it does not stick as tenaciously to the berries as a spray, but, even so, the berries should be closely picked before the material is applied so that several days may elapse before picking more berries.

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**A COMPLETE**

formula. No oil or other chemicals to add. Ready to mix with any type of water.

We manufacture and stock all types of insecticides for citrus and vegetable crops.

**Standard Spray And Supply Company**
**Lakeland, Florida**

## NATIONAL FOOD HANDLERS WILL HELP MARKET FLORIDA CITRUS CROP

(Continued from page 18)

back to production, gearing our whole program to the requirements of the consuming public.

"Let us enthusiastically join in a crusade to destroy the evil influences existing in the industry today and support sound principles that can protect and enhance the value of this great industry."

## *Classified Ads*

WANTED—Several bushels Cleopatra Mandarin seed; harvesting time delivery. Write R. R. Box 202, Route 2, Harlingen, Texas.

CITRUS TREES—Best quality usual varities on sour orange or rough lemon stock. Robt. P. Thornton, c/o Clay Hill Nurseries Co., Box 2880, Tampa, Florida.

FOR SALE — Lyonizer fertilizer spreader, speed sprayer, two supply units mounted on trucks and one model C Case tractor. Write Post office Box 336, Avon Park, Florida.

SUPERIOR CITRUS TREES. LIMITED number available for winter planting. Booking orders principal varieties for June planting. Trees on Rough Lemon, Sour Orange and Cleo root. Ward's Nursery, Avon Park, Fla.

AVOCADO-MANGO TREES 1947 PLANTING FOR SALE IN QUANTITY. BROOKS-TOWER NURSERIES Box 36, HOMESTEAD, FLORIDA.

FOR SALE BY RETIRING OWNER —50 acre, 14 year old grove, in excellent condition, of Marsh seedless grapefruit, Valencia, and Temple oranges. Located in the heart of the famous Indian River citrus section. Has excellent drainage, artesian well and three-room house. For past three years average gross income was $16,866. Sale price $1500 per acre, exclusive of present crop, 30% cash, balance on terms. For further information communicate with owner Alfred Warren, Route 1, Box 212, Vero Beach, Florida.

County and home demonstration agents in the United States received 10 million office calls for information and help from farm people in 1946.

Better CROPS More! PROFITS
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INCREASED PRODUCTION Per Acre
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# No Freeze Damage

**By heavy and continuous firing of our nursery and bearing avocado groves we brought them through the recent cold spells without any injury whatever. Even the most tender avocado blooms and new growth on Temple nursery trees were not injured.**

**At present we have a limited number of nice sized nursery trees for replants of the following varieties:**

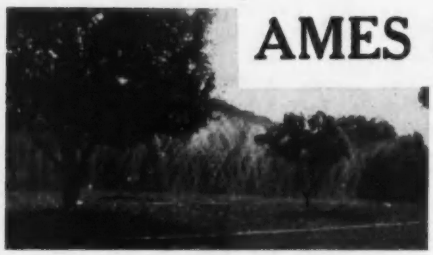
**Hamlin, Parson Brown, Valencia and Temple oranges.**

**Duncan and Marsh Seedless grapefruit.**

**A fine selection of nearly all standard varieties will be available for June planting. Orders being booked now.**

# Ward's Nursery

**Avon Park, Florida**



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